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(54) Identifying gemstones.

(57) In order to determine whether a particle is a diamond, 514.5 nm laser radiation, modulated at a frequency of 10 MHz to 1 GHz, is projected onto the particle 2, and the radiation emitted by the particle 2 is collected by a wide aperture viewing system 23 with narrow band pass filtering of the diamond Stokes or anti-Stokes Raman frequency appropriate to the laser wavelength. The emitted radiation is detected by a detector 6, and an associated electronic circuit 13,14,15 detects signals modulated at the same frequency as the laser modulation frequency. In this way, only Raman radiation is detected as this has a very short rise/decay time; other luminescence forms a background which is not modulated and can be removed by for instance thresholding, or heterodyne techniques. The method can be used to sort diamond from gangue on a wide belt, without very complicated optics.

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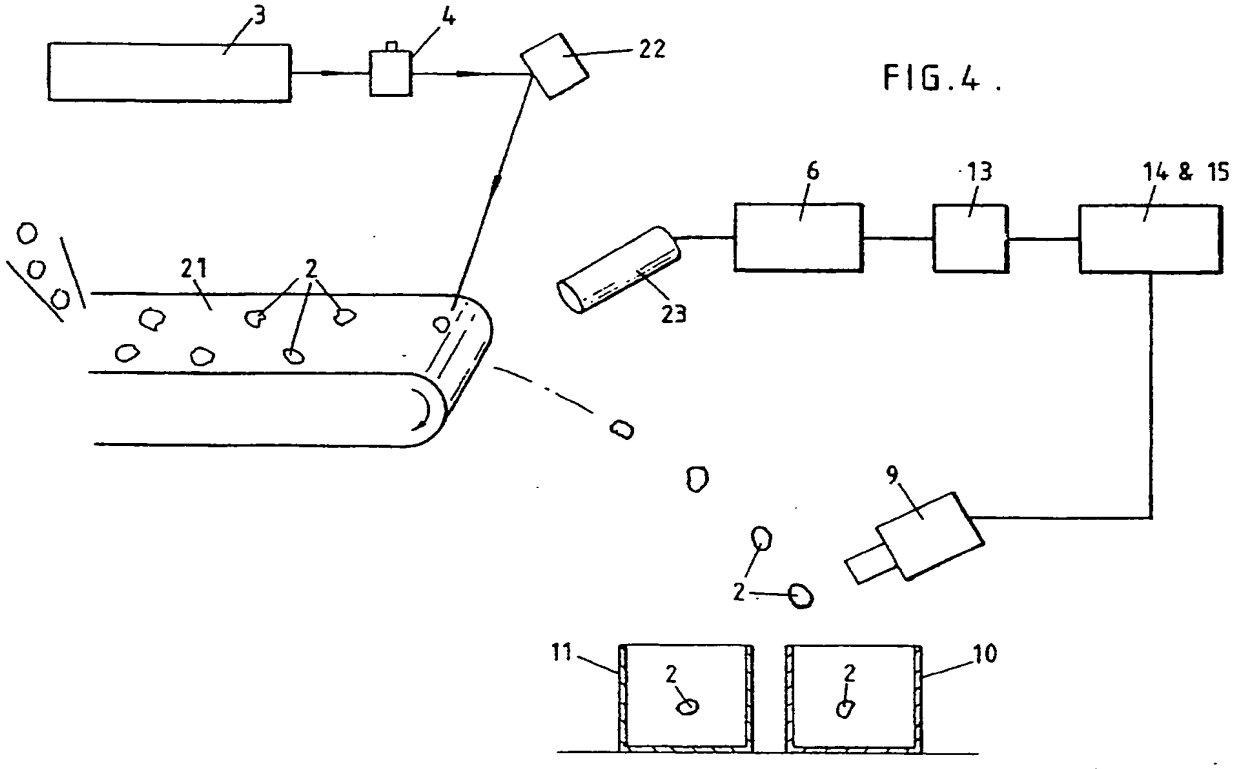

FIG.4.

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EUROPEAN SEARCH REPORT

Application Number

EP 89 30 4636

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
X	GB-A-2 018 984 (COMPAGNIE INDUSTRIELLE RADIOELECTRIQUE) * Page 1, lines 67-78; claims 1,2 *	1,7	G 01 N 21/62 G 01 N 21/65 G 01 N 23/223 G 01 N 21/87 // B 07 C 5/342
A	GB-A-1 528 699 (DE BEERS CONSOLIDATED MINES LTD) * Claims 1-7 *	1	
A	OPTICAL ENGINEERING, vol. 24, no. 2, March/April 1985, pages 352-355, Bellingham, Washington, US; M.D. DUNCAN et al.: "Imaging biological compounds using the coherent anti-Stokes Raman scattering microscope" * Page 352 left-hand column *	1,5,6	
A	US-A-3 736 428 (J.N. MONROE) * Claims 1,6 *	1,7	
A	US-A-4 200 801 (D.D. SCHURESKO) * Claim 1 *	1	
A	US-A-3 971 951 (K. RIKUKAWA) * Claim 1 *	1,7	TECHNICAL FIELDS SEARCHED (Int. Cl.5)
A	US-A-4 365 153 (O. SEIGEL) * Claims 1,3,23 *	1	G 01 N B 07 C
E	EP-A-0 341 095 (GERSAN ESTABLISHMENT) * Claims 1-13 *	1,2,4,5,7, 8,10	
E	EP-A-0 345 949 (GERSAN ESTABLISHMENT) * Column 7, line 40 - column 8, line 30 *	1,7,8	

The present search report has been drawn up for all claims

Place of search	Date of completion of search	Examiner
The Hague	27 November 90	VAN DEN BULCKE E.

CATEGORY OF CITED DOCUMENTS

X: particularly relevant if taken alone
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